Operational Instruments for Measuring SWx Radiation Impacts at Aviation Altitudes

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Abstract

The interaction of cosmic radiation with constituents of the atmosphere creates a secondary particle field which contributes to the radiation exposure of aircrew and passengers. The assessment of this exposure can be achieved by model calculations and measurements. Reliable measurements of dose quantities in the complex radiation field at aviation altitudes require qualified radiation measuring instruments operated under well-defined flight and SWx conditions. A set of several types of such radiation detectors has been used on commercial airline flights as well as in research aircraft by the German Aerospace Center (DLR) for many years. The goal of these measuring flights has been the acquisition of high quality dose data for scientific investigations and operational radiation protection purposes. The detector types used, i.e. Hawk, a tissue equivalent proportional counter (TEPC), Liulin, a silicon semiconductor detector, LB 6411-Pb, a neutron probe, and bubble detectors are introduced.

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